PROGRESS REPORT

GRANT NUMBER: 7310035

High Capacity Airborne Wind Turbine

Altaeros Energies

11/01/2013 – 01/31/2014

Deliverables Submitted

No official deliverables were scheduled to be submitted this period.

Budget

The amount invoiced to AEA is for $48,652.75 out of a total of $84,542.18. The main expenses were:

- Altaeros salary for Task 1-3
- Travel expense for Altaeros prototype testing for Task 2
- Materials for Task 2
- Outside service for Task 2
- Utilities and Rent for Task 2

Amount Invoiced to AEA to be Paid to Altaeros this Period: $48,652.75
Match Recorded: $35,889.43

Schedule Status

Our project received notice from the FAA of an unexpected delay of 3 to 6 months (see emails below). The cause of this delay was that the FAA's adoption of its draft Airborne Wind Energy Systems (AWES) policy has been delayed unexpectedly by 4 months to date, due to the federal government shutdown, personnel changes at the FAA, and the agency's focus on resolving Civilian UAV regulations first.

The FAA official responsible for studying our project in Alaska has notified our team that he cannot conduct an aeronautical study until the draft AWES policy is officially approved into the Federal Register. We contacted two leading airspace consultants (Westslope Consulting and Capital Airspace), both former FAA senior officials, who told us that this is expected to happen over the next 3-6 months. We are going ahead and submitting our FAA permitting documents, and will work with these consultants to help navigate the FAA process. However, they have both notified us that there is little that we can do until the FAA Washington DC office publishes its new policy, and that this is out of our control.

We are still confident of our ability to execute this project at our planned Eva Creek site. This delay will push our planned installation into the middle of winter, because we cannot complete our final siting until we have FAA approval for the Eva Creek site. Therefore, we believe that a 2014 installation is no longer feasible.

We are proposing to push back the planned installation of our turbine until the weather warms up in late Spring 2015. As a result of this delay, Altaeros and our project partners plan to reduce our project expenditure to the bare minimum expenses over the next 1-2 quarters until the FAA delay is resolved.

All other project work is on schedule.

Percent Complete

Tasks/Milestones	Start Date	End Date	Percent Complete
Task 1: Final site selection, permitting, and community forum	Mar-13	Dec-14	70%
Task 2: 30 kw turbine assembly and testing in Maine	Jul-13	Apr-15	35%
Task 3: Complete instrumentation plan and shakedown test plan	Jul-13	Dec-14	30%

Work Progress

Task 1:

- Site Selection
    - We confirmed selection of the the Eva Creek Wind Farm as our planned site.
    - We confirmed with Golden Valley that their offer to host us is valid.
    - We laid out a rough workplan of issues that will be resolved to execute the project (contract, power offtake, grid interconnection, site access, winter clearing, use of Golden Valley staff and facilities).

- Permitting
    - Our team worked with Golden Valley to obtain latitude/longitude and elevation data at the specific microsite.
    - Our team obtained prior FAA permitting data from Golden Valley to guide our application.
    - Our team had preliminary discussions with two leading airspace consultants (Westslope, Capital Airspace) with experience in Alaska and airborne wind respectively. We obtained a quote of future airspace consulting if needed from Westslope.
    - Our partner TDX exchanged preliminary emails with the FAA office and was notified that our aeronautical study would be delayed until the draft AWES policy was formally adopted in Washington DC.
    - Our team completed Form 7460-1 to submit to the FAA for a formal airspace evaluation.

Task 2:

- 30 kw turbine assembly and testing in Maine
    - Team completed one month of outdoor testing of half-size inflatable shell to evaluate refined aero and control design, stability and performance to guide the 30kW prototype development.
    - This prototype performed exceptionally well, demonstrating stable operation in 40mph+ winds and up to 500 feet above ground level.
    - The prototype was tested during daytime hours and successfully demonstrated fully-autonomous operations and landings.
    - Team initial power performance testing of small scale ducted rotor to to validate rotor design methodology and guide 30kW blade design.

Task 3:

- Instrumentation plan and shakedown test plan
    - Team completed basic instrumentation plan for the half-size inflatable shell.
    - Team completed and worked through basic shakedown test plan of the prototype inflatable shell.
    - Team compiled list of instrumentation options.
    - Team collected test data from each instrument to guide final selection.
    - Team has begun implementation of fault detection and handling for key points of failure in order to improve system fault tolerance.

Future Work

Task 1:

- Site Selection

- Preliminarily completed (Eva Creek), unless future permitting problem arises.

- Permitting
  - Work with FAA and airspace consultants to complete FAA aeronautical evaluation of Eva Creek site.
  - Begin formulating permitting strategy for Fish & Wildlife approval of Eva Creek Site

- Community Assessment (after FAA permitting)
  - Initiate follow up conversations to test hypothesis of no community concerns at Eva Creek site, and evaluate need for a Community Forum.

Task 2:

- Complete Alaska prototype full pilot design
  - Complete refined design of inflatable shell, including final material selection and structural design
  - Complete generator selection and rotor/turbine design.
  - Complete design of ground station and final winch and tether selection.
  - Update controls and communication system, including remote monitoring and data collection.
  - Implement fault detection and handling capabilities.
  - Work to improve total system reliability.

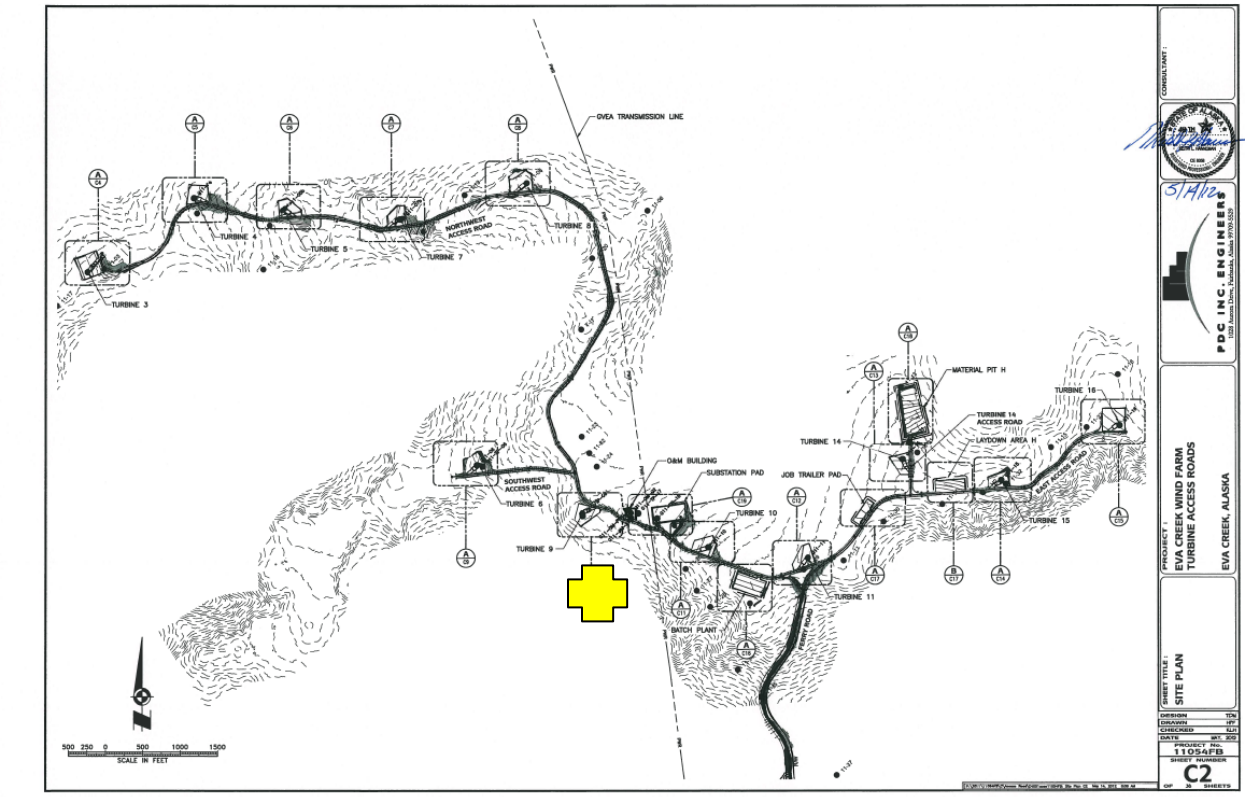
Task 3:

- Instrumentation plan and shakedown test plan
  - Develop initial test plan for 30kW turbine after design completed.

APPENDIX

Final Eva Creek Site Selection - SW of Turbine 9 (Task 1)

Map of Eva Creek Wind Farm – Selected location for project in yellow



Email from FAA notifying Altaeros project team of expected delay

-----Original Message-----
From: robert.van.haastert@faa.gov [mailto:robert.van.haastert@faa.gov]
To: Martin Miller
Cc: Sheri.Edgett-Baron@faa.gov
Subject: Re: meeting request

Hi Martin,

For clarification, FAA will eventually get to the point where an aeronautical study can be properly conducted on airborne wind turbines.

Latest information I have heard is that the FAA is developing a concept for these types of airborne wind turbines. HQ is coordinating the possible concepts (and evaluation procedures) into a document to be published in the Federal Register.

Until a set of processes/standards are established, the Obstruction Evaluation Group can not properly evaluate airborne wind turbine proposals.

Unfortunately, I do not have a timetable on when the Federal Register document is expected to be published or what issues the document will ask comment from the public.

Sorry I missed your Alaskan visit.

Robert van Haastert

Email from leading airspace consultant quoting potential airspace advisory work

Adam,

Per our conversation, the initial focus would be to conduct a radar study and an obstruction evaluation (OE). This would enable us to identify potential radar and airspace issues in advance of filing a 7460-1 with the FAA, to provide necessary information to develop the most appropriate strategy for engaging with the FAA and other possibly agencies, and to hopefully assist in expediting the overall Part 77 process. The cost for the radar study would be $6,000 and the cost for the OE study would be $3,600.

Regards,

Geoff Blackman
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WESTSLOPE CONSULTING

Buoyant Airborne Turbine Prototype Development (Maine, Task 2)

CAD Design of Alaska Pilot (Task 2)

Photos of Airborne winter testing up to 500ft of half-size inflatable shell prototype (Task 2)